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Structural and magnetic properties of CuSb2O6 probed by ESR

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Abstract

A detailed electron-spin-resonance (ESR) investigation is performed in the one-dimensional magnet CuSb2O6 on both single crystals and polycrystals. Angular-dependent ESR data on the single crystal are interpreted in terms of the anisotropic Zeeman interaction due to the Jahn-Teller distortion of the two inequivalent CuO6 octahedra. The very strong increase of the ESR linewidth with increasing temperature on approaching the monoclinic-to-tetragonal phase transition at about 400 K indicates the thermal activation of a dynamic Jahn-Teller process. Utilizing temperature-dependent x-ray diffraction experiments we propose the monoclinic angle β as the order parameter of this phase transition.